Release notes for ENDF/B Development n-044_Ru_096 evaluation

April 26, 2017

- **checkr** Warnings:

  1. A previous error halted parsing of the current section
     MAT=4425, MF= 1, MT=451 (1): Parsing stopped

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 1, MT=451
              SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER     232 TO     286
     ```

- **checkr** Errors:

  1. A variable is outside the allowed ENDF range
     MAT=4425, MF= 1, MT=451 (0): Variable range

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 1, MT=451
              MOD =     1 OUT OF RANGE    0 -    0          RECORD NUMBER    232
     ```

  2. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=4425, MF= 2, MT=151 (0): Directory (b)

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 2, MT=151
              SECTION  2/151 NOT IN DIRECTORY              RECORD NUMBER    288
     ```

  3. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=4425, MF= 3, MT= 1 (0): Directory (b)

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 3, MT=  1
              SECTION  3/  1 NOT IN DIRECTORY              RECORD NUMBER    432
     ```

  4. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=4425, MF= 3, MT= 2 (0): Directory (b)

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 3, MT=  2
              SECTION  3/  2 NOT IN DIRECTORY              RECORD NUMBER    466
     ```

  5. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=4425, MF= 3, MT= 4 (0): Directory (b)

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 3, MT=  4
              SECTION  3/  4 NOT IN DIRECTORY              RECORD NUMBER    495
     ```

  6. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=4425, MF= 3, MT= 16 (0): Directory (b)

     ```
           ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 16
              SECTION  3/ 16 NOT IN DIRECTORY              RECORD NUMBER    511
     ```

  7. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=4425, MF= 3, MT= 22 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 22
        SECTION  3/ 22 NOT IN DIRECTORY                RECORD NUMBER    520
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   $MAT=4425, MF= 3, MT= 28$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 28
        SECTION  3/ 28 NOT IN DIRECTORY                RECORD NUMBER    534
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   $MAT=4425, MF= 3, MT= 32$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 32
        SECTION  3/ 32 NOT IN DIRECTORY                RECORD NUMBER    545
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    $MAT=4425, MF= 3, MT= 51$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 51
        SECTION  3/ 51 NOT IN DIRECTORY                RECORD NUMBER    552
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    $MAT=4425, MF= 3, MT= 52$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 52
        SECTION  3/ 52 NOT IN DIRECTORY                RECORD NUMBER    568
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    $MAT=4425, MF= 3, MT= 53$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 53
        SECTION  3/ 53 NOT IN DIRECTORY                RECORD NUMBER    582
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    $MAT=4425, MF= 3, MT= 54$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 54
        SECTION  3/ 54 NOT IN DIRECTORY                RECORD NUMBER    595
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    $MAT=4425, MF= 3, MT= 55$ (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 55
        SECTION  3/ 55 NOT IN DIRECTORY                RECORD NUMBER    608
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    $MAT=4425, MF= 3, MT= 56$ (0): Directory (b)

2

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 56
           SECTION  3/ 56 NOT IN DIRECTORY                    RECORD NUMBER    620
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 57 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 57
           SECTION  3/ 57 NOT IN DIRECTORY                    RECORD NUMBER    632
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 58 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 58
           SECTION  3/ 58 NOT IN DIRECTORY                    RECORD NUMBER    644
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 59 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 59
           SECTION  3/ 59 NOT IN DIRECTORY                    RECORD NUMBER    655
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 60 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 60
           SECTION  3/ 60 NOT IN DIRECTORY                    RECORD NUMBER    666
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 61 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 61
           SECTION  3/ 61 NOT IN DIRECTORY                    RECORD NUMBER    677
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 62 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 62
           SECTION  3/ 62 NOT IN DIRECTORY                    RECORD NUMBER    687
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 63 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 63
           SECTION  3/ 63 NOT IN DIRECTORY                    RECORD NUMBER    697
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT= 91 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT= 91
          SECTION  3/ 91 NOT IN DIRECTORY                  RECORD NUMBER     707
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=102 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=102
          SECTION  3/102 NOT IN DIRECTORY                  RECORD NUMBER     716
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=103 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=103
          SECTION  3/103 NOT IN DIRECTORY                  RECORD NUMBER     738
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=104 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=104
          SECTION  3/104 NOT IN DIRECTORY                  RECORD NUMBER     754
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=105 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=105
          SECTION  3/105 NOT IN DIRECTORY                  RECORD NUMBER     766
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=106 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=106
          SECTION  3/106 NOT IN DIRECTORY                  RECORD NUMBER     776
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=107 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=107
          SECTION  3/107 NOT IN DIRECTORY                  RECORD NUMBER     789
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 3, MT=111 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 3, MT=111
          SECTION  3/111 NOT IN DIRECTORY                  RECORD NUMBER     805
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 2 (0): Directory (b)

4

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT=  2
          SECTION  4/  2 NOT IN DIRECTORY                    RECORD NUMBER     819
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 16 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 16
          SECTION  4/ 16 NOT IN DIRECTORY                    RECORD NUMBER    1001
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 22 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 22
          SECTION  4/ 22 NOT IN DIRECTORY                    RECORD NUMBER    1012
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 28 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 28
          SECTION  4/ 28 NOT IN DIRECTORY                    RECORD NUMBER    1023
```

35. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 32 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 32
          SECTION  4/ 32 NOT IN DIRECTORY                    RECORD NUMBER    1034
```

36. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 51 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 51
          SECTION  4/ 51 NOT IN DIRECTORY                    RECORD NUMBER    1045
```

37. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 52 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 52
          SECTION  4/ 52 NOT IN DIRECTORY                    RECORD NUMBER    1152
```

38. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 53 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 53
          SECTION  4/ 53 NOT IN DIRECTORY                    RECORD NUMBER    1175
```

39. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=4425, MF= 4, MT= 54 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 54
           SECTION  4/ 54 NOT IN DIRECTORY                    RECORD NUMBER    1198
```

40. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 55$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 55
           SECTION  4/ 55 NOT IN DIRECTORY                    RECORD NUMBER    1221
```

41. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 56$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 56
           SECTION  4/ 56 NOT IN DIRECTORY                    RECORD NUMBER    1244
```

42. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 57$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 57
           SECTION  4/ 57 NOT IN DIRECTORY                    RECORD NUMBER    1267
```

43. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 58$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 58
           SECTION  4/ 58 NOT IN DIRECTORY                    RECORD NUMBER    1290
```

44. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 59$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 59
           SECTION  4/ 59 NOT IN DIRECTORY                    RECORD NUMBER    1313
```

45. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 60$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 60
           SECTION  4/ 60 NOT IN DIRECTORY                    RECORD NUMBER    1336
```

46. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 61$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 61
           SECTION  4/ 61 NOT IN DIRECTORY                    RECORD NUMBER    1359
```

47. Missing a section in directory so your directory is messed up. This error will break everything else
$MAT=4425$, $MF= 4$, $MT= 62$ (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 62
          SECTION  4/ 62 NOT IN DIRECTORY                  RECORD NUMBER    1382
```

48. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 4, MT= 63 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 63
          SECTION  4/ 63 NOT IN DIRECTORY                  RECORD NUMBER    1405
```

49. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 4, MT= 91 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 4, MT= 91
          SECTION  4/ 91 NOT IN DIRECTORY                  RECORD NUMBER    1428
```

50. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 5, MT= 16 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 5, MT= 16
          SECTION  5/ 16 NOT IN DIRECTORY                  RECORD NUMBER    1452
```

51. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 5, MT= 22 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 5, MT= 22
          SECTION  5/ 22 NOT IN DIRECTORY                  RECORD NUMBER    1500
```

52. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 5, MT= 28 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 5, MT= 28
          SECTION  5/ 28 NOT IN DIRECTORY                  RECORD NUMBER    1716
```

53. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 5, MT= 32 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 5, MT= 32
          SECTION  5/ 32 NOT IN DIRECTORY                  RECORD NUMBER    1822
```

54. Missing a section in directory so your directory is messed up. This error will break everything else
  MAT=4425, MF= 5, MT= 91 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=4425, MF= 5, MT= 91
          SECTION  5/ 91 NOT IN DIRECTORY                  RECORD NUMBER    1859
```

- `psyche` Warnings:

  1. Non-threshold reaction with Q value differing from PSYCHE's expectations
  FILE 3 / SECTION 103 / THE CALCULATED Q 8.02908E+05 DISSAGREES WITH THE GIVEN Q 5.28458E+05 (0): Iffy Q

```
      FILE  3
        SECTION 103
               THE CALCULATED Q  8.02908E+05 DISSAGREES WITH THE GIVEN Q  5.28458E+05
```

- recent   Warnings:

   1. Fission widths given for non-fissile nucleus, but are zero
      0: Fission?

      ```
      Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
      ==============================================================================
      Retrieval Criteria-----------       MAT
      File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
      Reactions with No Background-    Output (Resonance Contribution)
      ... [318 more lines]
      ```

- fudge-4.0 Warnings:

   1. Cross section does not match sum of linked reaction cross sections
      crossSectionSum label 0: total (Error # 0): CS Sum.

      ```
      WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.97%
      ```

   2. Cross section does not match sum of linked reaction cross sections
      crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

      ```
      WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.11%
      ```

- fudge-4.0   Errors:

   1. Calculated and tabulated Q values disagree.
      reaction label 17: n + H2 + Tc94 (Error # 0): Q mismatch

      ```
      WARNING: Calculated and tabulated Q-values disagree: -15059027.48248291 eV vs -1.49786e7 eV!
      ```

   2. Calculated and tabulated Q values disagree.
      reaction label 18: Ru97 + gamma (Error # 0): Q mismatch

      ```
      WARNING: Calculated and tabulated Q-values disagree: 8106293.86416626 eV vs 8066390. eV!
      ```

   3. Calculated and tabulated Q values disagree.
      reaction label 22: H2 + Tc95_s (Error # 0): Q mismatch

      ```
      WARNING: Calculated and tabulated Q-values disagree: -5124798.341552734 eV vs -5045520. eV!
      ```

- njoy2012 Warnings:

   1. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
      groupr...compute self-shielded group-averaged cross-sections (0): GROUPR/conver (0)

      ```
      ---message from conver---cannot do complete particle production for mt= 16
                        only mf4/mf5 provided
      ```

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2. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (1): GROUPR/conver (0)

   ```
   ---message from conver---cannot do complete particle production for mt= 22
                       only mf4/mf5 provided
   ```

3. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (2): GROUPR/conver (0)

   ```
   ---message from conver---cannot do complete particle production for mt= 28
                       only mf4/mf5 provided
   ```

4. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (3): GROUPR/conver (0)

   ```
   ---message from conver---cannot do complete particle production for mt= 32
                       only mf4/mf5 provided
   ```

5. With the advent of the ENDF-6 format, it is possible to make evaluations that fully describe all the products of a nuclear reaction. Some carry-over evaluations from earlier ENDF/B versions also have this capability, but many do not. This message is intended to goad evaluators to improve things!
   groupr...compute self-shielded group-averaged cross-sections (4): GROUPR/conver (0)

   ```
   ---message from conver---cannot do complete particle production for mt= 91
                       only mf4/mf5 provided
   ```

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